

AMENDMENTS TO THE CLAIMS:

1. (Currently Amended) An apparatus for plasma doping, comprising:

a vacuum container defining a chamber therein, the container having a portion made of a dielectric material and bearing an impurity to be doped in a substrate provided in the chamber;
and

a plasma source operable to generate a plasma in the chamber by forming an electric field through the portion of the container, so as to cause ion in the plasma to impinge against the portion of the container to draw the impurity out of the portion of the container into the chamber,
wherein the dielectric material comprises one of silicone, silica glass and silicon nitride,
and

wherein the impurity comprises one of arsenic, phosphorus, boron, aluminum and antimony,

wherein the plasma source comprises:

a coil or antenna; and

a power source operable to apply a high frequency power to the coil or antenna so as to generate the plasma in the chamber,

wherein the power source comprises a first power supply operable to supply a first power with a first frequency (f1) and a second power supply operable to supply a second power with a second frequency (f2),

wherein the second frequency (f2) of the second power is less than one tenth of the first frequency (f1) of the first power,

wherein a capacitor is coupled to the coil or antenna,

wherein an impedance of the coil or antenna with respect to the first power with the first frequency (f1) is at least two times more than an impedance of the capacitor coupled to the coil or antenna, and

wherein an impedance of the coil or antenna with respect to the second power with the second frequency (f2) is less than one fifth of the impedance of the capacitor coupled to the coil or antenna.

2. (Previously Presented) An apparatus according to claim 1, wherein the impurity is deposited on a surface of the portion of the container.

3. (Previously Presented) An apparatus according to claim 1, wherein the impurity is provided inside the portion of the container.

4. (Canceled)

5. (Currently Amended) An apparatus according claim ~~[[4]]~~ 1, wherein ~~a second~~ an end of the coil or antenna is grounded.

6. (Currently Amended) An apparatus according to claim 1,
wherein the plasma source further comprises:
~~a coil or antenna;~~
~~a first power source operable to apply a first high frequency power to the coil or antenna~~
~~so as to generate the plasma in the chamber;~~

a biasing electrode provided between the coil or antenna and the portion of the container[[:]] and

~~a second power source operable to apply a second high frequency power to the biasing electrode.~~

7. (Original) A device having a part or a whole of the substrate to which the impurity is doped by means of the apparatus in claim 1.

8. (Currently Amended) An apparatus for plasma doping, comprising:

a vacuum container defining a chamber therein, the container having a portion made of a dielectric material and bearing an impurity to be doped in a substrate provided in the chamber; and

a plasma source operable to generate a plasma in the chamber by forming an electric field through the portion of the container, so as to cause ion in the plasma to impinge against the portion of the container to draw the impurity out of the portion of the container into the chamber,

wherein the plasma source is operable to draw out the impurity from the portion of the container such that the impurity is implanted into the substrate in a substantially even manner,

wherein the plasma source comprises:

a coil or antenna; and

a power source operable to apply a high frequency power to the coil or antenna so as to generate the plasma in the chamber,

wherein the power source comprises a first power supply operable to supply a first power with a first frequency (f1) and a second power supply operable to supply a second

power with a second frequency (f2),

wherein the second frequency (f2) of the second power is less than one tenth of the first frequency (f1) of the first power,

wherein a capacitor is coupled to the coil or antenna,

wherein an impedance of the coil or antenna with respect to the first power with the first frequency (f1) is at least two times more than an impedance of the capacitor coupled to the coil or antenna, and

wherein an impedance of the coil or antenna with respect to the second power with the second frequency (f2) is less than one fifth of the impedance of the capacitor coupled to the coil or antenna.

9. (Previously Presented) An apparatus according to claim 8, wherein the impurity is deposited on a surface of the portion of the container.

10. (Previously Presented) An apparatus according to claim 8, wherein the impurity is provided inside the portion of the container.

11. (Canceled)

12. (Currently Amended) An apparatus according to claim ~~11~~ 8, wherein a ~~second~~ an end of the coil or antenna is grounded.

13. (Currently Amended) An apparatus according to claim 8,

wherein the plasma source further comprises:

~~a coil or antenna;~~

~~a first power source operable to apply a first high frequency power to the coil or antenna
so as to generate the plasma in the chamber;~~

~~a biasing electrode provided between the coil or antenna and the portion of the
container[[]] and~~

~~a second power source operable to apply a second high frequency power to the biasing
electrode.~~